**Name: Group: Date:**

**Stretching and Shrinking Unit Test**

**Short Answer (Use Calculator)**

1. (6 points) The coach took a digital photo of the new cycling team bike. She sent a 30 cm by 40 cm photo to each team member.

30

40



**a.** If the photo were enlarged by a scale factor of 125% of its original size, what would be the new length and width? *(Find the decimal value first then use it to find the new dimensions*)

**b.** Imagine you want to make a 6 cm by 8 cm copy of the original photo. What **percent** should you use?

**c.** What is the scale factor from the original photo to the smaller photo?

**d.** How will the **angles** in the original photo compare to the corresponding angles in the smaller photo?

**e.** How many times larger is the **perimeter** of the original photo than that of the smaller photo?

**f.** How many times larger is the **area** of the original photo than that of the smaller photo?

2. (4 points) Megan wanted to make a new video game character.

**a.** Write a rule that would transform Mug (*x, y*) into Slug who is very wide (x) and not very tall (y).

**b.** Megan wanted Slug to move up (but not over) on the grid. What rule could do this for her?

**c.** Is Slug similar to Mug? Why or why not? (Is the rule the same for both x and y?)

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3. (2 points) Which rectangles below are similar? How do you know?



4. (2 points) A rectangle has dimensions of 1 and 6. Another rectangle was drawn from it using a scale factor of 2.5.

**a.** (2 points) Label both rectangles.

**b. (**1 point) Calculate the perimeter of both rectangles. (P= s+s+s+s or 2l+2w)

c. (1 point) The perimeter of the large rectangle is how many times the perimeter of the small rectangle?

d. (1 point) Calculate the area of both rectangles. (A= l x w)

e. (1 point) The area of the large rectangle is how many times the area of the small rectangle?

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5. (3 points) Below is a pair of similar figures. Find the missing measurements. Show your work. (Set up ratios & cross multiply)



c = b =

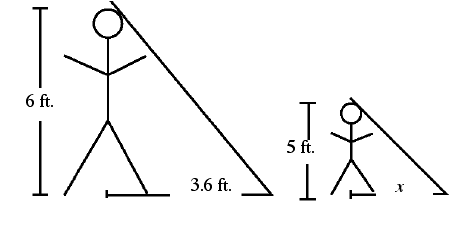
6. (2 points) If two figures are similar, which of the following *might* be **different**? Circle your answers.

number of sides size of angles

lengths of corresponding sides ratio of corresponding sides

shape area

7. (2 points) A 6-ft adult has a shadow 3.6 ft long. How long is the shadow of a 5-ft child standing next to the adult? Show your work.



8. (2 points) Gerald wanted to find the height of the flagpole at the entrance to his school. He used a mirror and recorded some measurements on a drawing. What is the height of the flagpole? Show your work.



9. (2 points) Refer to the diagram below to answer the following question.



After traveling 70 m, the submarine is 25 m deep. How deep with the submarine be if it continues its dive for another 110 m? Show your work.

**Stretching and Shrinking Unit Test**

**Answer Section**

**SHORT ANSWER**

1. ANS:

**a.** 37.5 inches by 50 inches

**b.** 20%

**c.** 1/5

**d.**  The corresponding angles in both photos will have the same measures: all 90°.

**e.** The perimeter of the original photo will be 5 times larger than the perimeter of the smaller photo.

**f.** The area of the larger photo is 25 times larger than the area of the smaller photo.

PTS: 6 OBJ: Investigation 1: Enlarging and Reducing Shapes

2. ANS:

**a.** Any rule in which the coefficient of *x* is relatively large compared to the coefficient of *y* will work; for example, (5*x*, 2*y*) or (3*x*, *y*) or (10*x*, 0.5*y*)

**b.** Student should add some positive number to the second coordinate in their rule from part a; for example, (5*x*, 2*y* + 4) or (3*x*, *y* + 3) or (10*x*, 0.5*y* + 8)

**c.**  Slug is not similar to Mug, because Slug is stretched more horizontally than vertically. The figures have different shapes.

PTS: 4 OBJ: Investigation 2: Similar Figures

3. ANS:

Rectangle 1 is similar to Rectangle 2. The ratio of length to width is 3 to 2. Corresponding sides in Rectangles 1 and 2 differ by a scale factor of 1.5. The corresponding angles in Rectangles 1 and 2 have the same measure (all 90°.) The perimeter of Rectangle 2 is 1.5 times the perimeter of Rectangle 1. The area of Rectangle 2 is 1.52 = 2.25 times the area of Rectangle 1.

PTS: 2 OBJ: Investigation 3: Similar Polygons

4. ANS:

**a.** The area is 2.52 = 6.25 times as great.

**b.** The perimeter is 2.5 times as great.

PTS: 2 OBJ: Investigation 3: Similar Polygons

5. ANS:

*b* = 1.25; *c* = 6

PTS: 3 OBJ: Investigation 4: Similarity and Ratios

6. ANS:

The following might be different: lengths of corresponding sides (if the scale factor is anything other than 1) and area (they will differ as the square of the scale factor).

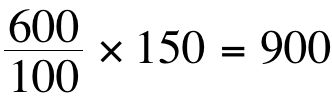
PTS: 2 OBJ: Investigation 4: Similarity and Ratios

7. ANS:

3 ft

PTS: 2 OBJ: Investigation 5: Using Similar Triangles and Rectangles

8. ANS:

The flagpole measures  cm.

PTS: 2 OBJ: Investigation 5: Using Similar Triangles and Rectangles

9. ANS:

approximately 64.29 m

PTS: 2 OBJ: Investigation 5: Using Similar Triangles and Rectangles